

In the Claims:

Claims 1 to 29 (canceled).

1 30. (new) A wood golf club head having plural structural
2 parameters including a first structural parameter having a
3 first value and a second structural parameter having a
4 second value respectively selected in combination with one
5 another so that said club head is thereby adapted to strike
6 and launch a golf ball with a launch angle and a backspin
7 speed of the golf ball within respective interrelated
8 ranges defined by a region bounded by a first ellipse in a
9 coordinate system having horizontal coordinates on a
10 horizontal axis designating the launch angle and vertical
11 coordinates on a vertical axis designating the backspin
12 speed, wherein said horizontal coordinates and said
13 vertical coordinates both have the same numerical scale and
14 spacing, and wherein said first ellipse has a first
15 centerpoint at a first said horizontal coordinate of 21
16 degrees and a first said vertical coordinate of 1800 rpm,
17 a first major axis with a length equal to 2100 rpm, a first
18 minor axis with a length equal to 5.7 degrees, and a first
19 tilt angle of 0.25 degrees of said first major axis tilted
20 counterclockwise relative to said vertical axis.

1 31. (new) The wood golf club head according to claim 30,
2 wherein the launch angle is at least 19° and the backspin
3 speed is not more than 3000 rpm.

1 32. (new) The wood golf club head according to claim 30,
2 wherein the region is more narrowly bounded by a second
3 ellipse within said first ellipse, wherein said second
4 ellipse has a second centerpoint at a second said
5 horizontal coordinate of 23 degrees and a second said
6 vertical coordinate of 1700 rpm, a second major axis with
7 a length equal to 1900 rpm, a second minor axis with a
8 length equal to 3.9 degrees, and a second tilt angle of
9 0.19 degrees of said second major axis tilted
10 counterclockwise relative to said vertical axis.

1 33. (new) The wood golf club head according to claim 32,
2 wherein the region is more narrowly bounded by a third
3 ellipse within said second ellipse, wherein said third
4 ellipse has a third centerpoint at a third said horizontal
5 coordinate of 23 degrees and a third said vertical
6 coordinate of 1700 rpm, a third major axis with a length
7 equal to 1400 rpm, a third minor axis with a length equal
8 to 2.8 degrees, and a third tilt angle of 0.19 degrees of
9 said third major axis tilted counterclockwise relative to
10 said vertical axis.

1 34. (new) The wood golf club head according to claim 30,
2 wherein the ellipse is determined by solving the equation
3 of motion according to the following equations:

4 $F_x(t) = -1/2(C_D(t)\cos \alpha + C_L(t)\sin \alpha) \rho A V_B(t)^2$

5 $F_y(t) = -1/2(C_D(t)\sin \alpha - C_L(t)\cos \alpha) \rho A V_B(t)^2 - mg$

6 $N(t+\Delta t) = - \rho A d C_m(t) V_B(t)^2 \Delta t / (4\pi I) + N(t)$

7 wherein $F_x(t)$ is force applied to the ball in flight in
8 a flight direction thereof at time instant t , $F_y(t)$ is force
9 applied to the ball in flight in a vertical direction at
10 time instant t , and $N(t+\Delta t)$ is decrease in a rotational
11 speed of the ball due to aerodynamic torque after time
12 interval of Δt ; and

13 wherein C_D : drag coefficient, C_L : lift coefficient,
14 α : elevation angle of the ball(deg), ρ : air density(kg/m^3),
15 A : ball sectional area(m^2) of the ball, V_B : ball
16 velocity(m/sec) of the ball, m : ball mass(kg) of the ball,
17 g : gravitational acceleration(m/sec^2), C_m : moment
18 coefficient, d : ball diameter(m) of the ball, I : moment of
19 inertia of the ball ($\text{kg}\cdot\text{m}^2$), N : ball rotational speed(rps)
20 of the ball.

1 **35.** (new) The wood golf club head according to claim 30, having
2 a striking surface adapted to strike the ball, wherein said
3 striking surface is formed of a low friction material.

1 **36.** (new) The wood golf club head according to claim 35,
2 wherein said low friction material comprises a coating of
3 diamond-like carbon (DLC), ceramic, or SiC applied on a
4 club head body of said golf club head.

1 **37.** (new) The wood golf club head according to claim 35,
2 wherein said low friction material consists of DYNEEMA®
3 FRP.

1 **38.** (new) The wood golf club head according to claim 35,
2 wherein said low friction material comprises a plating
3 layer of chromium or dispersed nickel plated on a club head
4 body of said golf club head.

1 **39.** (new) The wood golf club head according to claim 35,
2 wherein said low friction material comprises an insert of
3 polyacetal, polyamide, polytetrafluoroethylene,
4 polyphenylenesulfide, polyamideimide, or polyimide inserted
5 into a club head body of said golf club head.

1 **40.** (new) The wood golf club head according to claim 30, having
2 a striking face adapted to strike the ball, wherein said
3 striking face is formed of a composite material made from
4 pitch-based carbon fibers and a pitch-based matrix.

1 **41.** (new) The wood golf club head according to claim 30, being
2 a driver club head.

1 **42.** (new) The wood golf club head according to claim 41, having
2 a striking face adapted to strike the ball, wherein said
3 first structural parameter is a loft angle of said striking
4 face, and said first value of said loft angle is in a range
5 from 13 to 20 degrees.

1 **43.** (new) The wood golf club head according to claim 42,
2 wherein said first value of said loft angle is greater than
3 13 degrees.

1 **44.** (new) The wood golf club head according to claim 43,
2 wherein said second structural parameter is a coefficient
3 of friction of said striking face, and said second value of
4 said coefficient of friction is not more than 0.1.

1 **45.** (new) A wood golf club head having a striking face adapted
2 to strike and launch a golf ball, wherein:

3 said striking face has a coefficient of friction and
4 a loft angle selected in combination with one another so
5 that said club head is thereby adapted to launch the golf
6 ball with a launch angle and a backspin speed of the golf
7 ball within an angle-speed region bounded by an ellipse in
8 a coordinate system having first coordinates on a first
9 axis designating the launch angle and second coordinates on
10 a second axis designating the backspin speed,

11 said ellipse has a centerpoint at coordinates of 21
12 degrees and 1800 rpm, a major axis intersecting said
13 ellipse at coordinates of 16.42 degrees and 2849.99 rpm and
14 at coordinates of 25.58 degrees and 750.01 rpm, and a minor
15 axis intersecting said ellipse at coordinates of 18.15

16 degrees and 1799.99 rpm and at coordinates of 23.85 degrees
17 and 1800.01 rpm,

18 said launch angle is at least 19 degrees,

19 said backspin speed is not more than 3000 rpm; and

20 said loft angle is greater than 13°.

1 **46.** (new) A method of designing a wood golf club head
2 comprising the steps:

3 a) defining interrelated ranges of a launch angle and a
4 backspin speed of a golf ball in an angle-speed region
5 bounded by an ellipse in a coordinate system having
6 horizontal coordinates on a horizontal axis
7 designating the launch angle and vertical coordinates
8 on a vertical axis designating the backspin speed,
9 wherein said horizontal coordinates and said vertical
10 coordinates both have the same numerical scale and
11 spacing, and wherein said ellipse has a centerpoint at
12 said horizontal coordinate of 21 degrees and said
13 vertical coordinate of 1800 rpm, a major axis with a length
14 equal to 2100 rpm, a minor axis with a length
15 equal to 5.7 degrees, and a tilt angle of 0.25 degrees
16 of said major axis tilted counterclockwise relative to
17 said vertical axis;

18 b) testing golf club heads having various coefficients of
19 friction and loft angles of respective striking faces
20 thereof adapted to strike the golf ball, to determine
21 a correlation of said loft angles and said

22 coefficients of friction relative to said launch angle
23 and said backspin speed;
24 c) selecting, in combination with one another, a selected
25 coefficient of friction and a selected loft angle for
26 a striking face of a particular golf club head adapted
27 to strike the golf ball, such that the golf ball when
28 struck and launched by said particular golf club head,
29 will have said launch angle and said backspin speed
30 falling within said ellipse; and
31 d) designing said particular golf club head to have said
32 selected coefficient of friction and said selected
33 loft angle.

[RESPONSE CONTINUES ON NEXT PAGE]